DESCRIPTION

A SEPARATING DEVICE USED FOR A TOILET SEAT, IN WHICH A CONTINUOUS MANTLE FULLY COVERES AN ANNULAR SEAT FRAME

Technical field

The present invention relates to a sanitary device equipped on a toilet seat.

Background of the invention

Most of the toilet seats are not used by only a specific person. The toilet seat may contact directly with a lot of people during usage, so virtually it becomes a medium that spreads all kinds of the deadly pathogen. The existed patent technology has done a great effort to improve the toilet seat. For example, the patent ZL94243316.5 has disclosed a U-shape facing ring of the toilet seat, in which a jacket of the facing ring may be replaced. But this U-shape seat ring opens towards the backside, and an engine base is installed at the backside, so the engine base cannot be covered by the jacket.

As viewed from physics, the larger area of a seat that contacts with the hip is, the less force one unit area of the hip will bear, and the more comfortably the user will feel. This is just the reason for that sitting on a sofa is more comfortable than sitting on a wooden stool, especially for a person who has a weight body. Nevertheless, when we use the U-shape seat ring above mentioned which opens toward the backside, if a user gives consideration to comfort, in other words he sits on the seat ring in accordance with a normal sitting posture, then certainly, he will directly contact the engine base that is at the backside of the toilet seat. For there is not any separating measure taken for the cabinet, which is used for enclosing the engine base, a leak where is not sanitary will occur. Consequently, the separating effect cannot attain an absolute and real cleanness. If the user gives consideration to sanitation, and

then sits close to the foreside of the seat frame so as to keep a distance from the engine base provided at the backside of the toilet seat, the user's body will have to lean ahead and his center of gravity will have to move ahead. Accordingly, his hip's main part that bears his weight will suspend in space. His weight is supported by the root part of his thigh on both sides. It is obvious that the sitting posture of this kind will have a bad influence on blood circulation. And meanwhile for the sitting posture of this kind is unhealthy, the user's muscle will be in a stress state. Once the user has kept this posture for a time, he will feel discomfortably. Most of the seat rings of the conventional toilet seats have an annular shape, and some of them have a U shape but open towards ahead. All structures above are not in conformity to the anatomy structure of the human body's sitting posture.

Summary of the invention

The object of the present invention is to provide a new-style sanitary device equipped on a toilet seat. Not only it may truly attain a separating effect of the absolute clean, but also it possesses the advantages that comfort for sitting and convenience for using.

The technical solution used for the technical problems of the present invention are described as follows:

The present invention relates to a separating device used for a toilet seat, in which a continuous mantle fully covers an annular seat frame. The whole device is comprised of a seat frame, a mantle, a mantle recovery device and a turning cap. And the whole device is attached on the base of the toilet seat by a rotating shaft, so it may be raised up freely.

The seat frame has two types: one is a seat ring type, the shape of which is similar to a conventional seat ring. The seat frame of this type is made of a sheet material and covers directly on the edge of the toilet seat's base. It can replace the conventional seat ring. The other one is a framed type. The seat

frame of this type is a framed structure, and the shape of it is similar to a seat ring. The inner and outer frames of it rest on the inside and outside of a conventional seat ring, respectively. on the seat frame there is a fracture, where one or more opening/closing parts is provided. One end of the opening/closing part connects with the other part of the seat frame, and the other end of it can open and close freely. When the opening/closing part closes, the seat frame appears a full circularity.

At the connecting part that connects the seat frame with the base, a blade is provided.

The mantle is made into a roll. After the mantle is unwound, it takes the shape of a long tube. The mantle is put on the surface of the seat frame. And the mantle is made of a plastic film, or other single or composite film material that not only has a smooth inner surface but also is waterproof. For reminding the user to timely replace a new mantle, a referring sign is provided adjacent to the terminal end of the mantle.

When the mantle is to be put on, it is put onto the seat frame via the opening fracture of the seat frame. Then it moves around the seat frame by one round. At the back side of the seat frame, it is cut open from the outer side of the seat frame by a blade, and then it covers the other part of the seat frame's backside. Finally it comes into a recovery device via the fracture of the seat frame. After the opening/closing part is closed, the seat frame will takes the shape of a full circularity, and its surface that contacts with the human body is covered by one layer of the separating film (a seat frame of seat ring type) or by two layers of the separating film (a framed-type seat frame). An electric motor or a manual handle is adopted to power the recovery device that is used for recovering the used mantle and drive the new mantle to cover the whole surface of the seat frame. The above actions are repeated until the user sees the referring sign adjacent to the terminal end of the mantle. Accordingly the user may prepare a new mantle for replacing the used mantle timely.

The beneficial effect of the present invention is as follows:

For the seat frame is arranged to have a movable opening/closing part, a conflict between the mantle to be put on the seat frame and the sealing circularity of the seat frame may be solved. In the meanwhile, when the user is to replace the mantle, he may open the opening/closing part. Therefore, the problem that a new mantle may be polluted by the used mantle during replacement can be solved. Due to adoption of the design that a blade is provided at the connecting part between the seat frame and the base, after the mantle is cut open from the outer side of the seat frame, it will continue to cover the back side of the seat frame. Thereby, the conflict between covering the whole surface of the seat frame with the mantle and the mantle having to pass by the connecting part between the seat frame and the toilet seat's base also may be solved. Due to the settlement of above problems, the one-off mantle may cleanly and fully cover the whole round surface of the seat frame. Consequently the separating effect that the toilet seat is absolutely sanitary may be obtained.

After the opening/closing part has been closed, the circular seat frame will close up. Then, the user will feel that this seat frame is just the same as a conventional seat ring. Furthermore, a film material itself has a better characteristic of thermal insulation. An air film exists between the seat frame and the seat ring. Thereby, in autumn and winter when room temperature is not high, it may be avoided that the user's skin feels an instantly cold. As a result, we may achieve the design object that the user feels comfortably.

The mantle may be put on easily. And after it is put on, it may be used by scores of man-times, even by 100 man-times, depending on the different length of the mantle. Furthermore, during daily usage, the replacement of the mantle may be completed automatically only by starting up the electric motor or rotating the manual handle. Therefore, the operation is very simple.

Furthermore, a referring sign is provided adjacent to the terminal end of the

mantle. Then an awkwardness resulting from the lack of the mantle may be avoided. Accordingly, the design object of convenience and practicality may be attained.

Brief description of Drawings

Hereinafter, the present invention will be further explained in combination with the attached drawings and the embodiments.

Fig. 1 is a schematic diagram showing the first embodiment of the invention;

Fig. 2 is a schematic diagram showing a seat frame (framed-type) according to the first embodiment of the invention;

Fig. 3 is a cross sectional view, showing the rear part of the seat frame according to the second embodiment of the invention;

Fig. 4 is a cross sectional view, showing the rear part of the seat frame according to the third embodiment of the invention.

In the figures, each signs denotes as follows: 1.a seat frame, 1a.the rear part of the seat frame, 2.a mantle, 3.a blade, 4.a groove, 5.a rotating shaft of the seat frame, 6.a connecting part of the seat frame's rotating shaft, 7.a turning cap, 8. the edge of the mantle roll's notch, 9.a rotating shaft, 10.a mantle roll, 11.an UV sterilamp, 12.a power transmission mechanism, 13.a mantle recovery device, 14.a manual handle, 15.a center shaft of the recovery roll, 16.a recovery roll, 17.a driving roller, 18.an opening/closing part, 19.a framed-type seat frame part that crosses the seat ring, 20.an inner frame of the framed-type seat frame, 21.an outer frame of the framed-type seat frame, A. an inputting end of the mantle, B. an recovery end of the mantle.

Preferred embodiments

As shown in Fig. 1, the separating device mainly comprises a seat frame (1), a mantle (2), a mantle recovery device (13) and a turning cap (7).

In the first embodiment, the opening/closing part (18) is arranged at one side

of the seat frame (1). On the other side of the seat frame and adjacent to the connecting part that connects the seat frame with the base of the toilet seat, a blade (3) is provided. As shown in Fig. 1, the blade is preferably fixed at the connecting part (6) between the seat frame and the seat frame's rotating shaft. Along the edge of the seat frame, the connecting part is cut so as to form a narrow groove (4), which admits only a single layer of the mantle to be put onto. The edge of the blade is hided into the groove (4), in this way, it may avoid of the fact that the exposed cutting edge may injure people and make damages to clothing.

In Fig. 1, the seat frame (1) is a seat ring type made of a sheet material, while the seat frame shown in Fig. 2 is a framed type made of a bar stock. The inner frame (20) and outer frame (21) of the framed-type seat frame are rested respectively on the inner and outer edge of the known conventional seat ring (not shown in Figure). After the mantle is put on, the upper and lower layers of the mantle both cover the conventional seat ring. For the purpose of avoiding that the user feels uncomfortably, the seat frame part (19) that crosses the seat ring may take a flat shape. In the meanwhile, a recess may be fluted on the corresponding position of the seat ring. Also, the two ends of the seat frame part (19) that crosses the seat ring may be bent downward, so as to make the inner frame (20) and outer frame (21) lower than the plane of the seat ring. In this way, when having put on the mantle and using the device, the mantle may cover the upper surface of the seat ring and the edge of the seat ring.

Long tubular mantle (2) is winded on a sealed mantle roll (10). The sidewall of the roll is cut to have a notch, the two edges (8) of which are close with each other tightly. Then, we may prevent the mantle from moving back into the roll, also may prevent the dust from entering into the roll, so as to maintain the cleanness of the mantle in the roll. The starting part of the mantle stays out of the notch. And in order to remind the user timely to replace with a

new mantle roll, there is a referring sign adjacent to the terminal end of the mantle.

The mantle roll (10) may be made of recoverable materials, and thereby the mantle roll together with the mantle therein may be used only one time. Therefore, it is advantageous to environmental protection. The resource may be reused. And we may maintain the cleanness of the mantle during transportation, storage and usage.

The mantle recovery device (13) may be powered by an electrical motor or a manual handle. If both the electrical motor and the manual handle are provided, we may ensure that the recovery device works normally even when power is out.

A removable mantle recovery roll (16) is provided in the mantle recovery device (13). The pressing flaps or other structures for attaching the mantle are provided on the center shaft (15) of the recovery roll. The center shaft can engages with the power transmission mechanism (12).

The mantle recovery roll (16) may be made of a recoverable material, and used only one time. After a roll of the mantle has been used up, the recovery roll with the worn-out mantle thereinto may be taken out together and carried through a recovery processing. Therefore, it is advantageous to environmental protection. The resource may be reused. In the meanwhile it can simplify the operation, lessen the manual labor's strength during recovering the mantle, and solve the pollution problem caused by the worn-out mantle.

In the mantle recovery device (13), a driving roller (17) engaging with the power transmission mechanism (12) and a pressure roller opposite to the driving roller may be provided. Two rollers clamp the mantle between them so as to recover the mantel.

A rotating shaft (5) of the seat frame may engage with the power transmission mechanism (12). When the mantle is replaced, the seat frame (1) will be raised up, so as to ensure that the lower surface of the new mantle does not

contact with the peripheral of the base (seat frame of seat ring type) or the seat ring (framed-type seat frame). Then, even if the mantle turns upside down during sliding, it still can ensure a thorough cleanness. This design also can reduce the sliding resistance during replacement. Furthermore, a controller may be added to engage with a corresponding gear train. During different stages for replacing the mantle, the controller controls the gear chain to rotate forward and backward, or stop rotating. Accordingly, The rotating shaft (5) rotates along with the gear chain. And then a series of actions may be completed, such as raising up the seat frame when beginning to replace the mantle, and putting down the seat frame when having completed the replacement.

The mantle roll (10) is connected to the other parts of the device by a rotating shaft (9) that is perpendicular to the roll body. And the mantle roll (10) can rotate freely around the outputting direction of the mantle. In this way, even if the mantle turns upside down continuously during replacement, it still may be ensured that the mantle follows its path, turns back and be put onto the seat frame successfully. If we don't adopt a mantle roll, a supporting structure used for placing the mantle still connects with the other parts of the device by the rotating shaft that is perpendicular to the center shaft of the mantle roll. And the supporting structure also may rotate freely around the outputting direction of the mantle.

If the mantle recovery device (13) makes use of the electric power, a switch of the recovery device may be a conventional touch switch, or a non-touch switch including a type of photo switch. The touch switch is simply and reliable. The non-touch switch need not contact with the user's finger. Although the structure of the non-touch switch is more complicate, the non-touch switch is cleaner.

The electric motor may be connected to a controller. Once the electric motor or a driving roller rotates for a predetermined time or a predetermined number

of turns after startup, it will stop working. At this time, the new mantle will cover exactly the entire seat frame, so waste will not occur.

Furthermore, an UV sterilamp may be provided at the inputting end of the mantle (A). It connects with the controller. When the mantle is being replaced, the UV sterilamp is on, and when the replacement has been completed, the UV sterilamp is off. The UV sterilamp is used for sterilizing the mantle, so as to ensure that the mantle is clean.

For a great majority of the toilet seats, the water tanks thereof are arranged at the backside of the base, so preferably, the mantle roll or the supporting structure of the mantle in the first embodiment is arranged at the underside of seat frame's rotating shaft. After the mantle is output upwardly, it turns to direct forward and moves into the fracture of the seat frame, so we may keep the mantle away from the water tank at the backside.

With the above structures, the operation of putting on the mantle and the method for using the mantle in the first embodiment are described as follows: When the new mantle is to be put on, the mantle (2) is leaded out from the mantle roll (10), which locates at the underside of the seat frame's rotating shaft (5) (Fig.1 is a schematic diagram, for purpose of being easy to draw the figure, the mantle roll (10) shown does not locate at the underside of the seat frame's rotating shaft (5)). Then firstly, the mantle moves upward and turns to direct forward from the back of the seat frame's rotating shaft (5). Via the opening/closing part (18) of the seat frame, the mantle is put on the seat frame. Then the mantle moves around the seat frame by one round. At the rear part (1a) of the seat frame, the mantle comes into the groove (4), which is in the connecting part (6) of the seat frame's rotating shaft. From the outside of the seat frame, the mantle is cut open by the hidden blade (3) and covers the other part of the seat frame's rear part. Then, the mantle passes through the seat frame's fracture and comes into the mantle recovery device (13). At last, the mantle passes by the driving roller (17) and the pressure roller, and the

beginning part of the mantle is attached on the center shaft (15) of the recovery roll (16).

Then, the operation for putting on the mantle has ended. If we close the opening/closing part (18), the new mantle will prepare for providing its first-time service.

Hereafter, at every time the toilet seat is used, we start up the switch or rotate the manual handle (14). Under the action of the power, the seat frame (1) is raised up, and the driving roller (17) and the pressure roller wind in the used mantle. Due to the tension of the mantle, the opening/closing part (18) will tilt toward the mantle's inputting end (A) that connects with it. Consequently an included angle will be formed between the part (18) and the seat frame's plane. The new mantle is pulled out of the mantle roll (10). After having been irradiated by the UV sterilamp, which is turned on synchronously, the new mantle will be put on the seat frame via the opening/closing part. For the new mantle is kept apart from the used mantle passing below, the new mantle will not be polluted by the used mantle. Subsequently, the new mantle will be sequentially put on the foreside of the seat frame, cut open by the blade (3), covers the backside (1a) of the seat frame, at last fully covers the whole seat frame. After the seat frame is put down and the opening/closing part is closed, the mantle will prepare for providing its new service. In such a manner the mantle is used repeatedly until the referring sign occurs. Then the user can replace a new mantle timely.

After the mantle (2) passes through the seat frame's fracture, comes into the recovery device (13), and is pulled by the driving roller (17) and the pressure roller, the mantle may hang down into a waste box directly, so as to recover periodically.

For obtaining different schemes, modification may be made from many aspects, such as the direction at which the opening/closing part opens and closes, the position of the opening/closing part, and the number of the

opening/closing part. The opening/closing part may be designed to open and close above the seat frame's plane as the first embodiment. In addition, it may be designed to open and close under the seat frame's plane (as shown in Fig. 3 and 4). Even, it may be designed to open and close on the seat frame's plane. The opening/closing part may be at one side of the seat frame as the first embodiment. In addition, it may be at the backside (1a) of the seat frame. If the opening/closing part is at the backside (1a) of the seat frame, the connecting part (6) between the seat frame and the seat frame's rotating shaft can be reduced to have only one (as shown in Fig. 3 and 4). The number of the opening/closing part may be one as the first embodiment. In addition, the number of it may be more than one. Furthermore, the orientation in which the mantle is input on the seat frame and output from the seat frame, the position of the mantle roll (10), and the position of the mantle recovery device (13) also may be changed correspondingly.

For example, the second embodiment is shown in Fig. 3. Both of two opening/closing parts (18) are at the backside (1a) of the seat frame. Of which, the opening/closing part on the left side of the fracture opens and closes under the seat frame's plane, thereby it corresponds to the mantle recovery end (B) that is under the seat frame's plane. On the other hand, the opening/closing part on the right side of the fracture opens and closes above the seat frame's plane, thereby it corresponds to the mantle inputting end (A) that is above the seat frame's plane. The advantage of this embodiment is that, because the mantle's inputting end is arranged at a side face, the water tank at the backside of the toilet seat's base can be passed round thoroughly.

Furthermore, for example the third embodiment is shown in Fig. 4. On the basis of the second embodiment, the inputting end (A) of the mantle is designed at the same side as the recovery end (B) and arranged above the recovery end (B). Both of the new mantle and the used mantle pass under the seat frame. Furthermore, after the new mantle under the seat frame's plane

turns a 180 degree, it is put on the seat frame via the fracture of the seat frame. The advantage of this embodiment is that, the inputting end of the mantle can pass round the water tank thoroughly. And the inputting end and the outputting end of the mantle are close with each other, so the structure of the device will be compact. When the seat frame is put down after the seat frame is raised and the replacement of the mantle has been completed, the opening/closing part will close automatically. After the new mantle under the seat frame's plane turns a 180 degree, it is put on the fracture of the seat frame, thereby the appearance of the seat frame's upper surface will be cleaner and tidier.